

REMARKS

This Amendment is filed in response to the Office Action mailed on July 17, 2006. All objections and rejections are respectfully traversed.

Claims 6-9, 11-17, 19-20, and 23-53 are currently pending.

Claims 53 is added to better claim the invention.

Request for Interview

The Applicant respectfully requests a telephonic interview with the Examiner after the Examiner has had an opportunity to consider this Amendment, but before the issuance of the next Office Action. The Applicant may be reached at 617-951-3067.

Claim Rejections - 35 USC § 102

At paragraphs 3-4 of the Office Action, claims 6-8, 27, 42-43 and 51 were rejected under 35 U.S.C. §102 as being anticipated by Brunelle et al., US Patent No. 6,654,902, issued on Nov. 25, 2003, hereinafter Brunelle.

The present invention, as set forth in representative claim 6, comprises in part:

6. A method of claiming ownership of a disk by a network device in a network storage system comprising the steps of:

writing ownership information to a predetermined area of the disk; and

setting a small computer system interface reservation tag for the disk to a state of network device ownership to provide a two part indicia of

ownership for the disk, *where the two part indicia of ownership are both written to the disk.*

By way of background, Brunelle discloses a way of using standard small computer system interface (SCSI) persistent reservations with I/O barriers. The American National Standards Institute (ANSI) has standardized a number of SCSI Persistent Reservation commands, such as *Persistent Reserve Out*. See col. 1, lines 28-41. Brunelle describes issuing two of these commands to assign ownership to storage devices. See col. 5, lines 60-67. The first *Persistent Reserve Out* command includes a key describing a particular node owning the device. See col. 6, lines 38-48. The second *Persistent Reserve Out* command includes a parameter specifying an access type, such as “write exclusive read only.” See col. 5, lines 65-67 and col. 6, lines 48-54. Additionally, Brunelle describes writing registration information each time a node is initialized or changed.

Applicant respectfully urges that Brunelle does not teach or disclose Applicant’s claimed novel *writing ownership information to a predetermined area of the disk ... where the two part indicia of ownership are both written to the disk.* In further detail, Applicant’s claimed invention is writing ownership information directly to a disk in sector S, more specifically sector 0, of the disk. The ownership information written in the predetermined area is available for other non-owning network devices to read to determine who owns the disk. The SCSI reservation tag is also written to the disk and allows only the owner to write to the disk. The SCSI reservation tag prevents other non-owning network devices from writing to the disk.

Additionally, the Examiner states that Brunelle shows writing the first ownership information to disk, at Col. 3, lines 47-65, which states:

“Each storage network controller 112 includes a unique identifier identifying the storage network controller 112 on the storage network 108. The storage device 104 may be reserved for exclusive use by one or more storage network controllers 112 by storing the storage network controller's unique identifier with an associated access privilege for the storage network controller 112 in the storage device 104. For example, storage network controllers 112 located in a cluster node 102a or 102b may have read and write access privilege for the storage device 104 and a storage network controller 112 in the computer system 110 may have read-only access privilege for the storage device 104. By providing access privileges, a storage device 104 can be reserved for exclusive write access by cluster nodes 102a and 102b in a cluster 100. Thus, even though the non-cluster system node 110 is physically connected to the storage device 104 through the storage network 108, a storage network controller 112 connected to the storage network 108 may not have permission to write to the storage device 104.”

In reference to the statement above, Brunelle shows writing privileges for each network controller whether write access or read access, in a broad statement and does not disclose writing to a predetermined area of the disk, as claimed by applicant. These privileges are written to disk using multiple SCSI reservations which are stored in a reservation table on each disk. In contrast, Applicant's claimed invention writes a separate ownership information to the disk that is not in the form of a SCSI reservation tag. Applicant's claimed invention allows write access to be defined by the one or more owners written to the predetermined area of each disk, but the ownership information is still available for read only because of the use of SCSI reservation tag. The SCSI reservation tag prevents writing by non-owning network devices.

Accordingly, Applicant respectfully urges that Brunelle is legally insufficient to anticipate the present claims under 35 U.S.C. §102 because of the absence of the Applicant's claimed novel *writing ownership information to a predetermined area of the disk ... where the two part indicia of ownership are both written to the disk.*

Claim Rejections – 35 USC § 103

At paragraphs 5-6 of the Office Action, claims 9, 11-17, 19-20, and 23-24 were rejected under 35 U.S.C. §103 as being unpatentable over Brunelle, in view of Carlson et al., US Patent Application Publication No. 2003/0093501, hereinafter Carlson.

The present invention, as set forth in representative claim 9, comprises in part:

9. A network storage system comprising:
a plurality of network devices;
one or more switches, each network device connected to at least one of the one or more switch; and
a plurality of disks having a first ownership attribute written to a predetermined area of each disk and a second ownership attribute in the form of a small computer system interface reservation tag, wherein the first and second ownership attribute are written to each disk, each disk connected to at least one of the plurality of switches.

By way of background, Carlson discloses a Storage Area Network (SAN) where storage devices are interconnected by switches to form a fabric. See paragraph 0039.

Applicant respectfully urges that Brunelle and Carlson taken alone or in combination do not teach or suggest Applicant's claimed novel *a plurality of disks having a first*

ownership attribute written to a predetermined area of each disk and a second ownership attribute in the form of a small computer system interface reservation tag, wherein the first and second ownership attribute are written to each disk, each disk connected to at least one of the plurality of switches. In further detail, Applicant's claimed invention is writing ownership information directly to a disk in sector S, more specifically sector 0, of the disk. This ownership information is available for other network devices to read to determine who owns the disk. The SCSI reservation tag is also written to the disk and allows only the owner to write to the disk. The SCSI reservation tag prevents other non-owning network devices from writing to the disk. Brunelle only discloses writing SCSI reservation tags to the disk for access privileges. Col. 3, lines 47-65, of Brunelle only discloses a broad statement that access privileges are written to disk. There is no disclosure of writing to a predetermined area (sector s) and a SCSI reservation tag, as claimed by Applicant. Brunelle only uses multiple SCSI reservation tags, and the information written to the predetermined area in Applicant's claimed invention is not a SCSI reservation tag. Additionally, Carlson does not disclose or suggest writing two indicia of ownership to each disk.

Accordingly, Applicant respectfully urges that the combination of Brunelle and Carlson is legally insufficient to make obvious the present claims under 35 U.S.C. §103 because of the absence of the Applicant's claimed novel *a plurality of disks having a first ownership attribute written to a predetermined area of each disk and a second ownership attribute in the form of a small computer system interface reservation tag,*

wherein the first and second ownership attribute are written to each disk, each disk connected to at least one of the plurality of switches.

At paragraph 6, page 8, of the Office Action, claims 25-26 were rejected under 35 U.S.C. §103 as being unpatentable over Brunelle, in view of Carlson, and in further view of Jaskiewicz et al., US Patent Application Publication 2003/0061491, hereinafter Jaskiewicz.

Applicant respectfully notes that claims 25-26 are dependent claims that depend from independent claims which are believed to be in condition for allowance. Accordingly, claims 25-26 are believed to be in condition for allowance.

At paragraph 7 of the Office Action, claims 28-41, 44-50, and 52 were rejected under 35 U.S.C. §103 as being unpatentable over Brunelle, in view of Talagala et al., US Patent No. 6,732,289, hereinafter Talagala.

The present invention, as set forth in representative claim 28, comprises in appt:

28. A method for a network device to manage ownership of one or more storage devices in a network storage system, comprising the steps of:
 reading ownership information from a predetermined area of each storage device;
 in response to reading the ownership information, creating an ownership table that identifies the one or more storage devices owned by the network device;
 reading a small computer system interface reservation tag from each storage device;

comparing the SCSI reservation tag to the ownership information of the same storage device and, if there is not a match, changing the reservation tag to match the ownership information; and
configuring the one or more storage devices identified in the ownership table into at least one volume for use by the network device.

By way of background, Talagala discloses a fault tolerant system to transfer control from one storage controller to another storage controller. In communication with the storage controllers and one or more disk drives are failover managers (also known as failover software tasks "FST"). The FST (failover manager) receives a request from a storage controller. The request may be a request for ownership or a request for access. (Col. 4, lines 37-39). When a request for ownership is received, the FST will not make any decision with regard to which controller will own which disk drive, rather the FST will grant ownership to any storage controller that asks for ownership. (Col. 4, lines 42-49). When a request for access is received, the FST determines whether the requesting storage controller has ownership by reading a storage controller ID and comparing that to a current owner identified in memory. (Col. 5, lines 5-13). If the storage controller ID and current owner are the same, then the requesting storage controller is granted access. (Col. 5, lines 13-16). However, if the storage controller ID and the current owner are different, then the FST will deny access to the requesting storage controller. (Col 5, lines 17-19).

Applicant respectfully urges that Brunelle and Talagala, taken alone or in combination, do not teach or suggest Applicant's claim novel step of ***comparing the SCSI reservation tag to the ownership information of the same storage device and, if there is not a match, changing the SCSI reservation tag to match the ownership information.*** In further detail, Applicant's claimed invention uses two part ownership identification

method. The first part of this ownership method is writing of ownership information to a predetermined area of each disk. Within the system, this ownership information acts as the definitive ownership attribute. This predetermined area of the disk can be any known and constant location on each of the disks. The second part of the ownership method is setting of a SCSI reservation to allow only the disk owner to write to the disk. This use of a SCSI reservation allows other servers to read the ownership information from the disks. Additionally, the ability to change the SCSI reservation tag to match the ownership information stored in the predetermined area of disk allows a storage server to configure the disks into the appropriate RAID groups and or volumes. The ownership information stored on the storage device (sector S) is the controlling ownership information on the disk.

Brunelle makes no mention of comparing the SCSI reservation tag to the ownership information. As such, Brunelle can not possibly show this aspect of the Applicant's claims. Indeed, the Examiner apparently admits that Brunelle lacks this aspect at paragraph 1 on page 10 of the Office Action, and instead turns to Talagala.

Talagala discloses a system for automatically granting ownership to any storage controller that requests ownership, and granting access to storage controllers who own the disk. There is no disclosure in Talagala of ***changing the SCSI reservation tag to match the ownership information*** stored in the predetermined area of each storage device, as claimed by Applicant. Applicant's invention changes the SCSI reservation tag to allow ownership access if the SCSI reservation does not match. In contrast, Talagala automatically grants ownership to any storage controller that requests ownership without reading the ownership information stored on the disk. Additionally, Talagala denies access if the storage controller ID and the ownership information stored in memory do not

match. Applicant's invention allows access (read-only) if the SCSI reservation tag and ownership information written to disk do not match.

Accordingly, Applicant respectfully urges that the combination of Brunelle and Talagala is legally insufficient to make obvious the present claims under 35 U.S.C. §103 because of the absence of the Applicant's claimed novel step of *comparing the SCSI reservation tag to the ownership information of the same storage device and, if there is not a match, changing the SCSI level 3 persistent reservation tag to match the ownership information.*

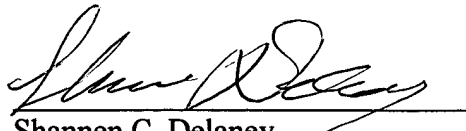
All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims.

The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,


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